FL.02

PRELIMINARY SURVEY OF INTERNATIONAL MINERALS AND CHEMICAL CORPORATION Mulberry, Florida

Work performed
by the
Health and Safety Research Division
Oak Ridge National Laboratory
Oak Ridge, Tennessee 37830

March 1980

OAK RIDGE NATIONAL LABORATORY
operated by
UNION CARBIDE CORPORATION
for the
DEPARTMENT OF ENERGY
as part of the
Formerly Utilized Sites--
Remedial Action Program

INTERNATIONAL MINERALS AND CHEMICAL CORPORATION
Mulberry, Florida

At the request of the Department of Energy (DOE, then ERDA), a preliminary survey was performed at the International Minerals and Chemical Corporation in Mulberry, Florida (see Fig. 1), on April 6, 1977, to assess the radiological status of the facilities utilized under Atomic Energy Commission (AEC) raw materials contracts during the period 1951 through 1955. Billie B. Turner, Vice President (Florida Operations) of International Minerals and Chemical Corporation, provided information about the AEC project. G. F. McKereghan also provided information about the project and escorted the survey team to the site of the former plant. The plant was constructed as a result of a negotiated contract with the AEC [Contract No. AT(49-1)-538 and Contract No. AT(49-1)-545].

From information contained in contracts and obtained during the survey, it was determined that the project involved the research and development, construction, and operation of a pilot plant whose function was to process material from the leached zone of the Florida Land Pebble Phosphate Field for the recovery of uranium (U_3O_8). Later contracts [No. AT(49-1)-630] indicate that a large recovery plant followed the pilot project and was constructed and operated at the Bonnie Chemical Plant.

Present Use of Facilities

The facility utilized in the AEC project was apparently a single-story, steel-frame structure which has been completely demolished leaving a concrete pad (see Fig. 2). The pad measured 50 x 250 ft. No information was available as to the radiological status of the facility at the time operation ceased nor the location of equipment and materials used in the facility.

Results of Preliminary Survey

The preliminary survey was conducted by H. W. Dickson of the Oak Ridge National Laboratory and W. T. Thornton of the Department of Energy-Oak Ridge Operations Office (then ERDA). An exploratory survey of the

concrete pad and areas surrounding the pad was performed, which consisted of randomly selected locations where gamma-ray exposure-rate measurements were made 1 m above the pad surface and in areas surrounding the pad. Additionally, beta-gamma dose-rate measurements were made at 1 cm from the surface of the pad with a Geiger-Mueller survey meter. Soil and debris samples were collected where elevated radiation levels were observed, both from areas adjacent to and on the pad.

Results of measurements indicated that the maximum gamma-ray exposure rates were 10 to 15 μR/hr at 1 m above the pad surface and a maximum beta-gamma dose rate of 0.1 mrad/hr at 1 cm from pad surface. A maximum exposure rate of 100 μR/hr at 1 m from the surface was observed (see Fig. 3). This measurement was taken in debris found at a point northeast of the pad. The background for areas around the plant site was 40 to 45 μR/hr at 1 m above the surface. Soil and debris sample radionuclide analysis results are presented in Table 1. All other radionuclides in the samples were in concentrations below detectable limits.

Results of this preliminary survey indicate there is activity present in soil samples which may exceed current guidelines, and that isolated spots revealed elevated gamma-ray exposure rates greater than those for the general plant area. However, it cannot be concluded that these results are attributed to former AEC contract operations without a more in-depth assessment of the radiological status of the entire area involved. Radiation levels and radionuclide concentrations observed at this site are similar in magnitude to measurements made in nonuranium recovery areas at phosphate products plants currently in operation.[1,2]

References

1. F. F. Haywood, D. J. Crawford, R. W. Doane, W. F. Fox, W. A. Goldsmith, R. W. Leggett, W. H. Shinpaugh, and D. R. Stone, *Radiological Survey of the Former Virginia-Carolina Chemical Corporation Uranium Recovery Pilot Plant, Nichols, Florida*, Final Report, U.S. Department of Energy, DOE/EV-0005/18, January 1980.

2. F. F. Haywood, W. A. Goldsmith, R. W. Leggett, R. W. Doane, W. F. Fox, W. H. Shinpaugh, D. R. Stone, and D. J. Crawford, *Radiological Survey of the Former Uranium Recovery Pilot and Process Sites, Gardinier, Incorporated, Tampa, Florida*, Final Report, U.S. Department of Energy, DOE/EV-0005-- (to be published).

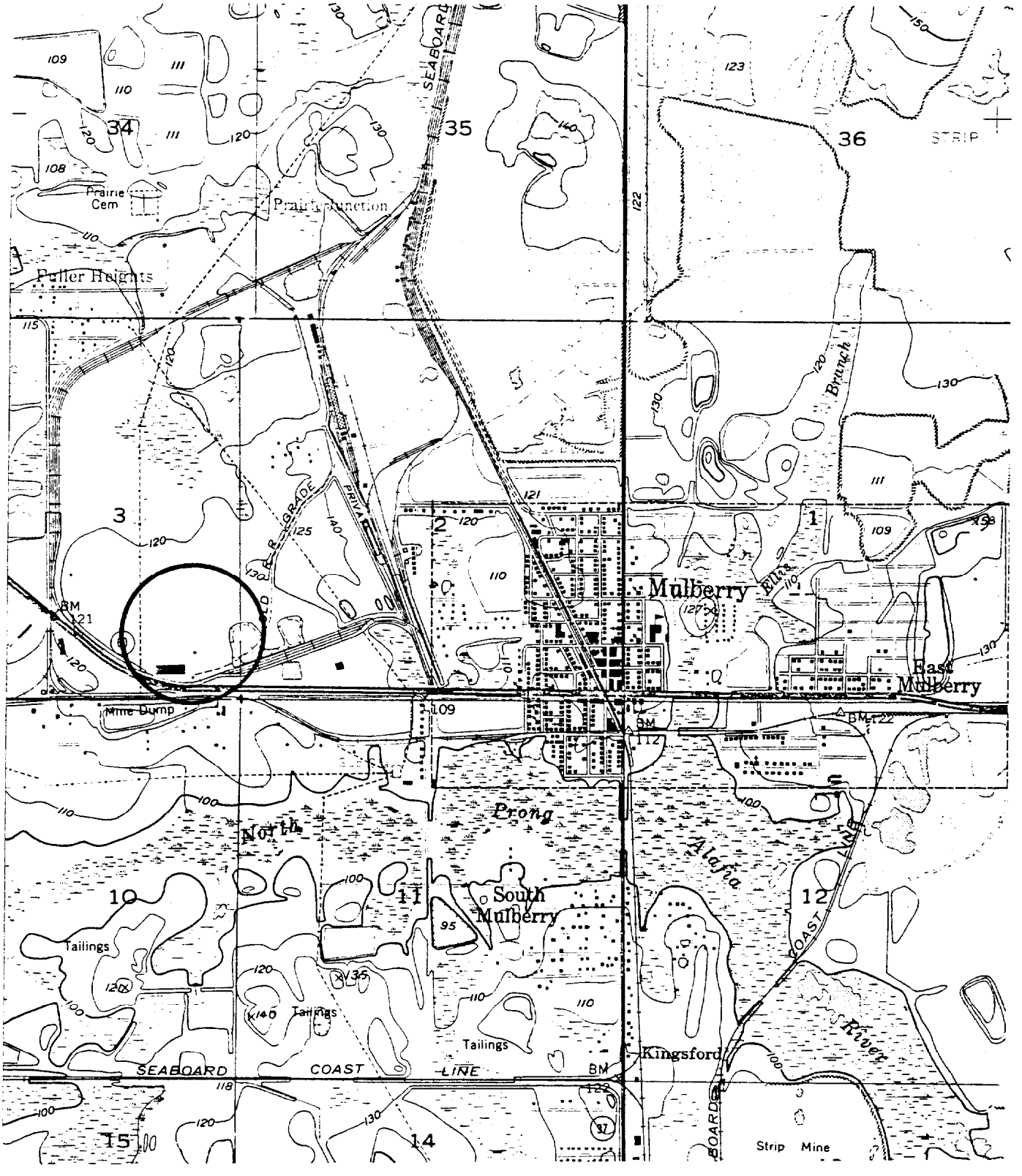
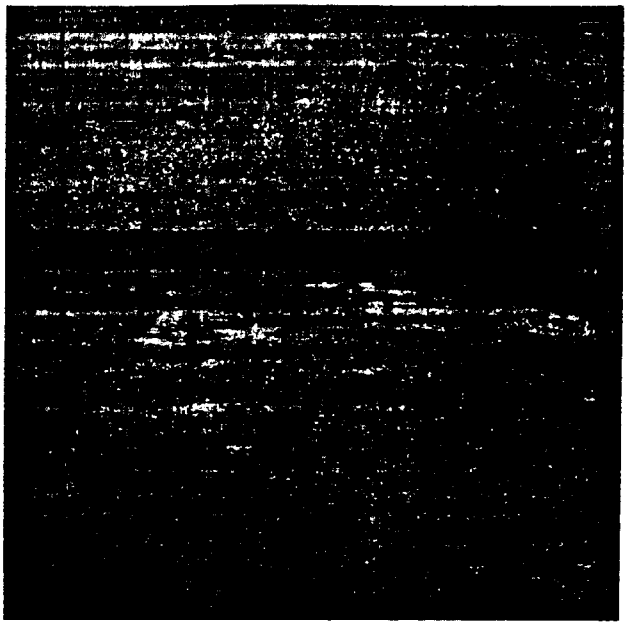
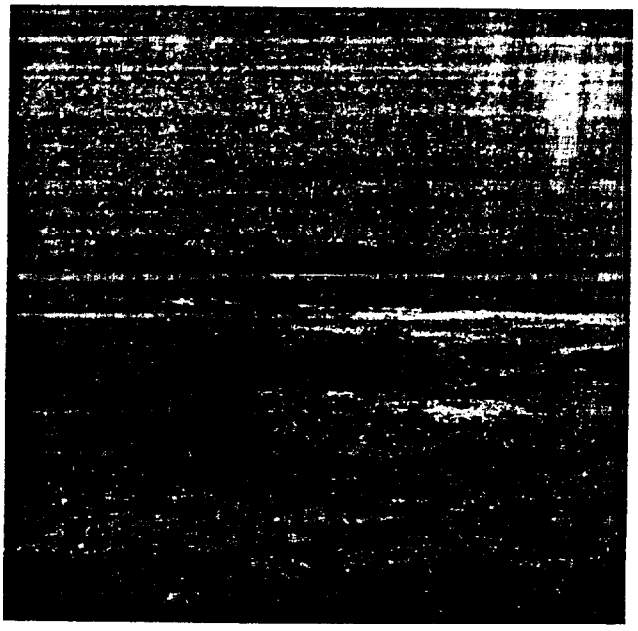


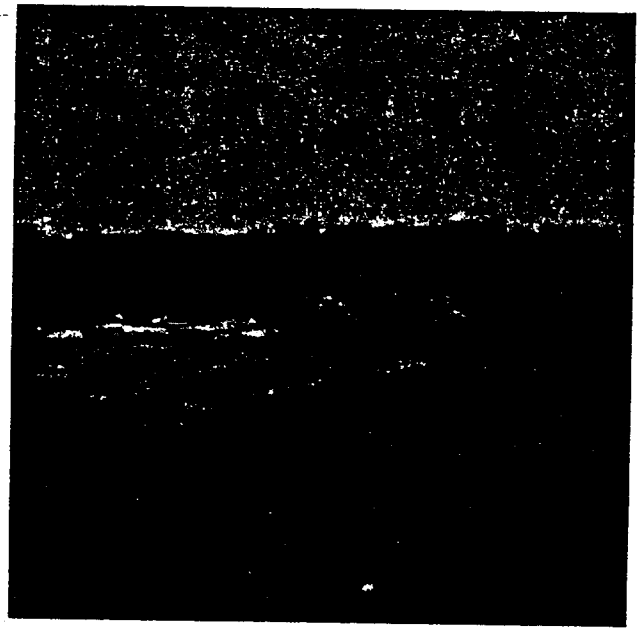
Fig. 1. Location of the International Minerals and Chemical Corporation in Mulberry, Florida.



International Minerals and Chemicals,
Mulberry, Florida site of Pilot Plant.
April 6, 1977



International Minerals and Chemicals,
Mulberry, Florida site of Pilot Plant.
Sample taken near raised slab in
center
April 6, 1977



International Minerals and Chemicals,
Mulberry, Florida site.

Fig. 2. Three views of concrete slab on which pilot plant building was located.

ORNL-DWG 80-9761

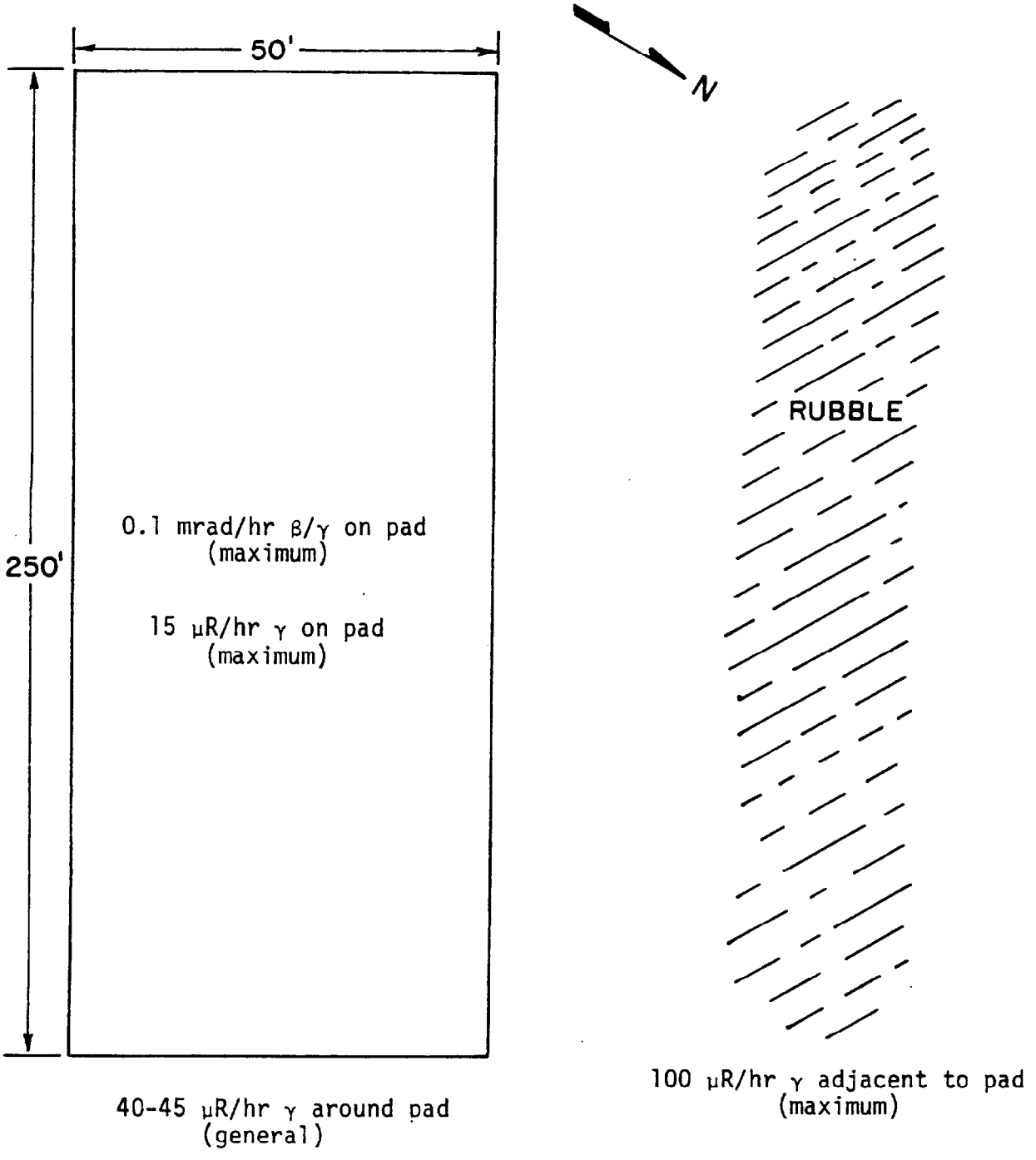


Fig. 3. International Minerals and Chemical Corporation site at Mulberry, Florida.

Table 1.

Location	Radionuclide	Concentration (pCi/g)
Soil from pad surface	^{226}Ra	28.1
	^{238}U	39.0
	^{137}Cs	1.73
Debris adjacent to pad	^{226}Ra	19.0